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SCIENCE NEWS LETTER

THE WEEKLY SUMMARY OF CURRENT SCIENCE • JANUARY 6, 1945



Rare Triplets
— See Page 8

A SCIENCE SERVICE PUBLICATION

Penicillin in Lozenges

Letting it dissolve in the mouth like cough drops found to be effective method of treatment for strep throat and trench mouth.

► **GIVING PATIENTS** penicillin lozenges to dissolve in their mouths like cough drops is an effective method of using the mold chemical to combat strep sore throat, trench mouth and other mouth and throat infections, two British scientists, Dr. Alexander B. MacGregor and Dr. David A. Long, report.

Pain, fever and disease germs were banished in 24 hours in some cases. All the trench mouth patients, 25 at the time of the report, were free of symptoms within 24 hours, and within five days their mouths had completely healed and they could stop the medicine. Up to three and one-half months later there were no relapses, although the British doctors point out that procedures to eliminate gum pockets and stagnation areas will be necessary to prevent reinfection at a later date.

In cases of acute streptococcal tonsillitis there was "great relief" in 24 hours and within 48 hours all the patients were free of fever. A grown person severely ill with scarlet fever began taking solid food within 24 hours after the lozenge treatment was started.

No other treatment was given, not even mouth washes, to these and the trench mouth patients.

Hope that the lozenges might clear up the chronic carrier state was doomed to disappointment, however. Streptococcus

germs were banished from the throats of the carrier while they were taking the lozenges, but in most of the patients the germs returned soon after the treatment was stopped. A medical student, however, was kept free of the carrier state long enough to finish his training in obstetrics, which the doctors point to as of practical value.

The lozenges also proved effective in combating germs in surgical cases such as tonsillectomies, tooth extractions and the like.

The lozenges, three-fourths of an inch square by one-eighth of an inch thick, are made of gelatin and penicillin with a small amount of preservative. They have a "very slightly bitter taste" which apparently is not noticeable when there is any infection in the mouth or throat. Well persons who tried the lozenges did not find the bitterness "actively unpleasant."

The lozenge is put in the cheek and left there to dissolve without chewing or sucking. As soon as one has entirely dissolved, the patient takes another. One is taken at bedtime and during the night if the patient awakens. One patient by mistake ate 10 of them during the first five minutes of treatment, but otherwise there was no trouble getting patients, even children, to take the lozenges as directed.

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BIOCHEMISTRY

Germ Stopper in Leaves

► **PENICILLIN-LIKE** substances, hostile to germ life, may be found in leaves, fruits and other organs of a wide range of higher plants, as well as in lower plants like the molds, bacteria and algae that have until now been their only known sources. Evidence on this point is offered by E. H. Lucas and R. W. Lewis, research workers at Michigan State College of Agriculture and Applied Science. (*Science*, Dec. 29.)

The two men found antibiotics (germ-stopping substances) in the leaves of

Scotch thistle, mullein and peony, and in the fruits of blueberry, currant, mountain-ash and honeysuckle. One species of honeysuckle even had two distinct antibiotic substances in its berries.

Not all plants, however, yielded extracts with antibiotic properties. Only negative results were obtained from horseradish, turnip and several varieties of cabbage.

The two investigators were induced to undertake their research by two hints in existing botanical knowledge: (1)

actively growing and functioning zones of roots are normally able to keep up their activities despite the presence in the soil of germs known to be capable of killing them; (2) folk medicine (usually regarded as more or less superstitious) prescribes a great variety of plant extracts, poultices, etc., as "good for" many kinds of infection.

The researchers comment:

"The results obtained so far indicate that a wide field is opening up for exploration. In all probability, the problems to be encountered will be of a general biological nature rather than being confined to the inter-relations between bacteria and higher plants. Broader aspects are coming into the picture, heretofore merely touched but not yet developed."

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CHEMISTRY

Million Organic Compounds Obtainable from Crude Oil

► **MORE** than a million new organic compounds may be produced in the future from petroleum and natural gas, declared Dr. Gustav Egloff of the Universal Oil Products Corporation of Chicago before the Los Angeles section of the American Chemical Society. "Petroleum refining," he said, "is becoming more and more a chemical industry."

Natural gas and petroleum, he stated, are veritable treasure troves of paraffin, olefin, acetylene, cycloparaffin, cyclo-olefin, and aromatic hydrocarbons that open vast vistas in chemical research which have been only faintly explored. Individual compounds, such as isopentane, isooctane, triptane, isobutylene, butadiene, toluene, and styrene, and chemical compounds such as phenols, cresols, organic acids, resins, plastics, explosives, synthetic rubber, and many other derivatives are being produced from petroleum.

The industries based on the newer petroleum chemistry, involving aliphatic hydrocarbons as base materials, have infinitely greater possibilities than the industries based on coal tar chemistry, he declared, even though it is estimated that coal tar has served as a source of about 500,000 derivatives. Coal-tar hydrocarbons are mainly aromatic in character, and this limits the number of derivatives which can be produced from them.

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The best bath sponges come from the Mediterranean coast, Australia, Bahamas, Florida, and the north coast of Cuba.

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MEDICINE

Paralysis Relieved

Muscle function is restored in patients crippled by arthritis and injury or infection by injections of synthetic chemical, neostigmine.

► ENCOURAGING results with a new treatment to restore muscle functioning in patients crippled by paralysis, rheumatoid arthritis and injury or infection are reported by Dr. Herman Kabat, of the U. S. Public Health Service. (*Public Health Reports*)

An elderly woman confined for six years to bed and wheel chair because of rheumatoid arthritis was able after two weeks of treatment to stand up and walk.

A man paralyzed on his right side for 17 years was able, 24 hours after starting the treatment, for the first time in many years, to touch the top of his head, the opposite shoulder, the opposite buttock, his mouth, chin, put a cigarette in his mouth, lift his shoulder blade and move his hip. After one month of treatment he could stand up straight with both heels on the ground, both knees straight and only slight humping of his back.

The treatment that brought about these and similarly striking improvements in other patients when other treatment had failed consisted in injections under the skin once or twice a day of neostigmine. This synthetic chemical is also known as prostigmine. It has for some years been used successfully to relieve the fatigue and muscle weakness of myasthenia gravis.

Dr. Kabat and Dr. M. E. Knapp, of the University of Minnesota Medical School, in 1943 reported trying it in the treatment of infantile paralysis. They found it produced relaxation of muscle spasm, relief from pain, increase in strength and improvement in muscular coordination in the polio patients. This and other studies suggested to Dr. Kabat that it might prove effective in a variety of conditions in which failure of nerve and muscle functioning was causing crippling and disability.

So far he has tried it in 53 patients. Some had muscle spasm, contracture, joint weakness, pain and muscular weakness persisting for a long period after sprains, fractures and other injuries or after chronic infection. Some had hemiplegia, which the layman calls a paralytic stroke. Some had Bell's palsy. Others

had facial paralysis. Included in the group were five patients with the spastic type of cerebral palsy. Rheumatoid arthritis and bursitis of the shoulder were the other conditions.

"Improvement in range of motion, relief from pain and increase in strength and endurance may occur rapidly," Dr. Kabat reports.

What percentage of patients suffering from these conditions can be helped by the neostigmine treatment cannot be stated at present. Further study is needed to determine this. Patients in whom active inflammation, loss of innervation or bony or fibrous consolidation of a joint is the primary cause of the disability cannot be expected to benefit from the treatment.

"The results have been encouraging enough to warrant further investigation," Dr. Kabat states, adding that an evaluation of the treatment is now being made.

How neostigmine achieves its results is not definitely known. It is known to act on the central nervous system to inhibit or block nerve messages that would cause spasm and excessive tone or tension of muscles.

It may also facilitate formation of new pathways in the central nervous system. Such formation of new pathways for messages to and from muscles is generally considered part of the mechanism of recovery of function following brain damage and resulting paralysis. In these cases the possibilities of neostigmine proving effective will be distinctly limited, Dr. Kabat points out. It can only help within the limits imposed by the irreversible brain damage and the possibilities for formation of new nerve pathways to the abnormally functioning muscles.

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GENERAL SCIENCE

New AAAS President Is Dr. C. F. Kettering

► DOCTOR Charles F. Kettering, vice president of General Motors Corporation and chairman of the National Inventors Council, was elected president of

the American Association for the Advancement of Science.

A scientific session of the Association was held in September for the first time since the war, but the election of officers did not take place at that time. The usual time for the annual meeting of the Association is during Christmas week.

Dr. Kettering, inventor of the automobile self-starter, is one of the American pioneers in the development of robot airplanes. (*See SNL, July 8, 1944.*)

Newly elected vice presidents of the various sections of the AAAS are as follows:

Mathematics, Dr. E. P. Lane, University of Chicago. Physics, Dr. R. C. Gibbs, Cornell University. Chemistry, Dr. Henry Eyring, Princeton. Astronomy, Dr. J. J. Nassau, Case School of Applied Science. Geology and Geography, Dr. Arthur Beven, University of Virginia. Zoology, Dr. Carl G. Hartman, University of



TELEVISION relay tower that will receive and transmit several types of messages at the same time is exhibited here to Walter S. Lemmon, general manager of the Radiotype Division of the International Business Machines Corp., left, by Paul L. Chamberlain, manager of General Electric transmitter division. This is a model of the actual transmitter that will be built to send and receive all at one time automatic teletypewriter messages; facsimile which prints pictures and words on paper exactly as they are sent; FM, the means of broadcasting that is static free; and television programs. The tower was designed by I.B.M. and General Electric engineers.

Illinois. Botany, Dr. F. D. Kern, Pennsylvania State College. Anthropology, Dr. A. Irving Hallowell, Northwestern University. Psychology, Dr. Florence Goodenough, University of Minnesota. History and Philosophy of Science, Dr. John F. Fulton, Yale University. Engineering, George A. Stetson, editor, *Mechanical Engineering*. Medical Sciences, Dr. Warfield T. Longcope, Johns Hopkins University. Agriculture, Dr. William Albrecht, University of Mis-

souri. Education, Dr. H. H. Remmers, Purdue University.

Dr. Otis Caldwell, Boyce Thompson Institute, is general secretary of the AAAS; Dr. F. R. Moulton is permanent secretary and Director William E. Wrather, U. S. Geological Survey, is treasurer.

Newly elected members of the executive committee are Dr. A. J. Carlson of the University of Chicago and Dr. Walter R. Miles of Yale University.

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CHEMISTRY

Three Sources of Water

► **MEN ADRIFT** on a life raft now have three sources of fresh drinking water, thus bringing to a successful solution a situation which for centuries has posed a rough problem for men who battle the seas.

The most abundant source of drinking water is rainfall. Rain is caught in tarpaulins and transferred to an empty food tin or other receptacle for drinking.

However, the weather man cannot be counted upon to supply rain whenever men need a drink. Frequently men adrift on the sea are exposed to the hot, parching rays of the sun for days on end. Realizing this, Army Air Forces scientists set to work to find a way to use the sun's rays to take the salt out of sea water. The result was the solar still. Today, as long as the sun shines bright, and there's water in the sea, no castaways adrift need perish from thirst.

The solar still is a vinyl plastic envelope, 30 inches long with rounded ends 12 inches across. A plastic screen covered with black cellulose sponge is stretched through the middle. About 90% of the sun's rays pass through the transparent "skin" of the envelope, which is inflated by blowing it up like a balloon. The sponge, soaked with two quarts of sea water, absorbs the heat. The heat evaporates the water, which passes off as vapor, just like steam from a teakettle, leaving only the sea salt and other minerals in the sponge. This vapor condenses as fresh water on the inside of the skin of the envelope and then runs down into a reservoir at the bottom of the still. The still is tied outside the raft and floats on the water, requiring little or no attention. On a sunny day the still will make about one pint of fresh drinking water. Six stills are packed aboard each life raft.

The third source is a chemical sea water desalting kit that comes packed in a neat can. It is designed for use when the sky is overcast, when there is neither rain nor sun. Heart of the chemical kit is a compound consisting of about two-thirds silver put up in briquettes in a package weighing about 22 ounces. One of these briquettes is dropped into a plastic bag filled with sea water. Almost instantly the briquette disintegrates and by precipitation removes the harmful salt and other substances. This kit produces eight times the amount of water contained in one drinking-water can.

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AGRICULTURE

Cabbage and Turnip Crops Threatened by Widgeons

► **GROWERS** of cabbage and turnip seed in the Puget Sound region, where a large part of the American garden-seed production is now centered, have been having their troubles with widgeons. The U. S. Fish and Wildlife Service has had to come to their rescue and devise means for driving off the web-footed marauders.

Widgeons are a species of wild duck. Discriminating hunters don't care much for them, often scornfully referring to them as "trash ducks," because they aren't as good eating as nice, fat mallards or canvasbacks. Widgeons feed by choice on small seeds—and cabbage and turnip seed are small. This semi-immunity from shooting, coupled with their specialized appetite, has compounded trouble for the seed farmers, whose fields they raid at night.

The Fish and Wildlife Service has at least partially solved the problem by devising a kind of mechanized scarecrow—or perhaps more accurately, scareduck.

It consists of an ordinary automobile spotlight, mounted on a motor-driven turntable and set to revolve and flash at ten-second intervals. A storage battery supplies the power.

When the device is first turned on, a few shots are fired from a shotgun, which sends the widgeons on their way in a hurry. On subsequent nights, the birds don't even wait for the shots, but clear out as soon as the light begins to flash.

One of these revolving lamps is usually sufficient to scare the widgeons off a couple of hundred acres of cabbage field.

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ENTOMOLOGY

Total Insect War Urged

Program for extermination of pests instead of merely control is declared possible and practicable. Success against fruit fly cited.

► **TOTAL WAR** against man's insect enemies, with the avowed object of total extermination instead of mere "control," was offered as a possible and practicable program before the American Association of Economic Entomologists in New York, in the address of its retiring president, Prof. E. O. Essig of the University of California. Man has unintentionally wiped out a number of animal species, like the dodo and the passenger pigeon; there seems to be no good reason why he should not be able to repeat the performance intentionally with other species he finds obnoxious, if he will only plan carefully enough and follow through with sufficiently long and intensive campaigns of eradication.

Success in at least one such campaign was cited by Prof. Essig. About 20 years ago the Mediterranean fruit fly, a terrible menace to certain fruit and vegetable crops, especially the citrus fruits, was accidentally introduced into Florida. Drastic measures were necessary, but by thorough cooperation among federal, state and private interests the last traces of the fly infestation were wiped out in a short time.

Similar success appears to be in sight in campaigns now being waged against other insect pests. Among these, Prof. Essig mentioned the Mexican fruit fly, pink bollworm, and sweet-potato weevil in the South, and the pear psylla in the Pacific Northwest. Prospective victims suggested by the speaker for future anti-insect blitzes include Japanese beetle, gypsy moth, browntail moth, all kinds of malaria mosquitoes, bedbugs, lice, fleas and houseflies.

A powerful agent in these postwar wars to make crops less costly and personal life safer, more comfortable is the now widely known DDT. At the meeting, the first official pronouncement of organized entomological science on this insecticide was offered, in the form of a special committee report.

DDT has tremendous possibilities, the report emphasized; but there are also some difficulties attending its use that need further investigation without loss of time. For this reason, adequate funds

and personnel for research were pointed out as desirable, together with the assignment of sufficient quantities of DDT for experimental purposes.

DDT's promise spreads broadly over three fields: public health, household comfort, and agriculture. In the first category come the triumphs already scored by DDT against such plagues as malaria and typhus. Household comfort will be promoted by the abatement or even the complete wiping out of such insects as flies, fleas, bedbugs and "nuisance" mosquitoes. DDT can be useful to agriculture not only in combating field and orchard insects but also in protecting forests, livestock and poultry.

DDT is poisonous to man and the warm-blooded animals generally if swallowed in sufficient quantity, or absorbed through oil on the skin. However, as commonly used at present, there seems to be an adequate margin of safety. Cold-blooded animals like fish and frogs, and beneficial insects, are more sensitive; their protection was cited as one of the desirable objectives of research.

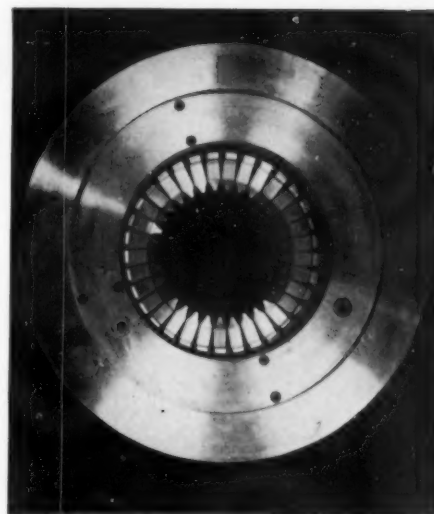
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ENGINEERING

Gear Cutting Machine Cuts All Teeth at Once

► **GEAR CUTTING**, an all-important job in the manufacturing of practically every machine, is revolutionized by a new machine developed by the Michigan Tool Company that cuts all gear teeth on a gear wheel at the same time with radically fed form-tool blades having a shear-cutting action. It is a rapid machine capable of rough and semi-finish cutting 60 to 100 gears an hour, depending upon the job.

The machine contains a circular cutter head consisting of a ring with the form-tool blades arranged on the inner circumference. When the gear wheel is placed on the work holder in the machine it is automatically clamped, and the cutter head is automatically lowered into cutting position. The work moves up and down. At the beginning of each up stroke, all blades in the cutting head



SPEEDS GEAR CUTTING—Cutting all the teeth of a gear at one time cuts down greatly the time required for making these important machine parts. The cutter head shown here does the job. It is part of a new machine designed by Michigan Tool Company engineers.

are advanced slightly an equal amount. On the return stroke the blades are retracted enough to provide for clearance for the tools.

The machine is adjustable and largely automatic when set. The amount that the blades are fed into the work on each stroke is adjustable, and the correct sizing of the work is also automatically controlled and adjusted. Adjustments are likewise provided for speed of vertical reciprocation and length of stroke.

To sharpen blades, or to change over to another type of gear to be cut, the entire inner cutter-head assembly is removed as a unit, and another head inserted. Only a simple grinding operation is required to bring dull blades back to correct form.

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CHEMISTRY

Chemical May Preserve Flavor of Processed Foods

► A **CHEMICAL** relative of vitamin C may be useful in preserving the vitamin C content, the color and the flavor of processed fruit juices and other foods, W. B. Esselen, Jr., J. J. Powers and R. Woodward, of Massachusetts State College, announced.

The substance, called de-iso ascorbic acid, is a harmless compound, they reported.

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CHEMISTRY

Plastics Research Spurred

For the pending demands of the postwar era, new plastic materials are being perfected for new uses, and machinery used in production of plastics is being redesigned.

► **PROOF THAT** research in plastics is being spurred to meet the pending postwar demands for many plastic items was given at the first general session of a meeting of the Society of the Plastics Industry, held in New York, when 25 experts, representing various industrial companies engaged in plastics work, presented reports of accomplishments and suggestions for further scientific study in the field.

New plastic materials are being perfected for new uses, and machinery used in the production of plastics is being redesigned for larger volume production. There was also evidence that many firms with little or no previous experience in designing plastics and producing articles made from plastics will enter the field after the war.

The need for standardization of words and language, weights and measures for the purpose of communicating ideas and carrying on trade in the plastics field was voiced at the meeting by W. A. Evans, of the Bell Telephone Laboratories, New York.

When the unit of measure has been developed, Mr. Evans recommended that measuring devices be provided. He also called attention to the need for being able to buy plastics by specification, with an established set of identifying characteristics for each type of plastic.

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Plastics Heated by Radio

► **IN EXTRUDING** plastics for the manufacture of such products as plastic thread for use in the production of plastic cloth, and thicker filaments for plastic screens used by the armed forces in tropical countries, the main problem is to soften, and if possible melt the plastic, Paul Quinn, consulting engineer, told the meeting.

The use of high-frequency radio waves makes it possible to heat a mass of plastic from the center outward and transform it into a uniform molten mass, after which it can be extruded through a die at low pressure, and surface-hardened by current methods. This method eliminates the high pressures and mechanical

strain of the old type of extruder, Mr. Quinn stated.

Up to the present time, the heating of plastics before extrusion has been attempted by conduction of heat, he commented. Water or oil were first heated to a known temperature, then the heat was transferred from the liquid to metal by conduction and finally from the metal to the plastic, also by conduction.

One possibility opened up by the use of low-pressure extrusion made possible by high-frequency radio wave heat was cited by Mr. Quinn. It is the coating, with plastics, of low-strength yarns and cords, also tinsel wire which is a combination of very delicate copper ribbons interwound with cotton thread and twisted together, forming a rough, easily distorted cord of little strength. Plastic coating would give the yarns, cords, and tinsel wire added strength desirable for industrial or commercial use.

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Printing on Plastics

► **JOINT** effort between the printing ink industry and the plastics industry was called for by J. J. Micik of the International Printing Ink Division of the Interchemical Corporation, Brooklyn, N.Y. Plastics such as cellophane, nitro-cellulose and cellulose acetate are being printed by rotogravure, letterpress, silk screen and other methods. Each of these processes uses a different type of printing ink. The problems presented by coating applications can be effectively solved by combined research and cooperation of both industries, he stated.

It is necessary to know the type of plastic being used, Mr. Micik pointed out, because a thermo-plastic could not be speedily dried after printing by means of high-temperature baking, since it would become soft or possibly melt.

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More Synthetic Resins

► **UNLIMITED** postwar civilian applications for synthetic resins made with resorcinol that possess high strength and great durability were predicted by Philip

H. Rhodes, chief of research and production of the Pennsylvania Coal Products Company, at the meeting. Among the present uses mentioned were those in the fields of marine, aircraft and building construction, furniture, castings, coatings, and grinding wheels.

Chemists find many applications for resorcinol known chemically as "meta hydroxy phenol." It is used as a reagent in the manufacture of medicines and organic chemicals, in tanning, and in making unbreakable phonograph records; a substitute for camphor in making celluloid; a sensitizer for silver bromide-gelatin photographic papers; and an ingredient in tooth powders, hair lotions and skin creams. In the production of synthetic resins for plastics, resorcinol reacts with formaldehyde to give resins that correspond in many ways to phenol-formaldehyde resins.

Until a short time ago resin formation with resorcinol was practically impossible to control, Mr. Rhodes reported. The reaction that took place when the resorcinol and formaldehyde were processed together proceeded almost explosively, so that a fully cured resin was produced before chemists could stop the progress of the reaction and permit castings to be made or adhesives produced.

Through special techniques developed during an investigation carried on by the Pennsylvania Coal Products Company over several years, many desirable properties of resorcinol resins were created, Mr. Rhodes stated. While these techniques are covered by secrecy orders from the Patent Office, and therefore may not be disclosed at present, the properties are familiar to many users in such applications as paper- and fabric-laminated plastics that have greater strength than similar materials made with phenol-formaldehyde resins; and in the manufacture of grinding wheels, where the length of wear and efficiency is twice that given by phenol-formaldehyde resins.

Increased temperature greatly accelerates the cure of these resins, although they were originally developed for room-temperature bonding. The use of higher than room temperatures is prevalent in the manufacture of heavy laminated timbers such as have been employed in the small-boat program of the Navy Department. Temperatures as low as 140 degrees Fahrenheit are sufficient with these resins for the production of laminated white oak timbers for ship use as keels, ribs, skegs and other parts that undergo severe stresses in actual use, Mr. Rhodes declared. He also pointed out that wide-

spread use of these resins is being made in the manufacture of plywood tubing.

Resorcinol resins, Mr. Rhodes declared, have also been used as bonding agents in the assembly gluing of laminated (sandwiched) and molded phenolic plastics,

nylon, natural and synthetic rubbers, and other materials. By treating metal surfaces with baked priming coatings of certain thermosetting resins, he stated, excellent bonds are obtained with resorcinol resins used as bonding agents.

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MEDICINE

Vitamin Used for Typhus

Large doses of para-aminobenzoic acid are found effective against louse-carried disease when given during first week of illness.

► **LARGE DOSES** of para-aminobenzoic acid, one of the vitamins of the B complex, have been found effective against louse-carried typhus when the treatment is begun during the first week of illness, report Lieut. Comdr. Andrew Yeomans (MC), U. S. N. R., and Lieut. Col. J. C. Snyder, Maj. E. S. Murray, Capt. C. J. D. Zarafonitis and Maj. R. S. Ecke of the Medical Corps, A. U. S. (*Journal, American Medical Association*). The course of the disease was made less severe and the average duration of the fever considerably shortened.

Twenty cases of louse-borne typhus were treated with the para-aminobenzoic acid, a constituent of liver and yeast, at the United States of America Typhus Commission Ward at the Fever Hospital, Cairo, Egypt. The course of the disease was compared with that of 44 other patients who did not receive the treatment.

It was found that large amounts of the para-aminobenzoic acid could be administered with ease to patients suffering from typhus. Except for a tendency to develop a low white-blood cell count, no unfavorable effects were observed when the acid was properly administered.

Patients given the treatment were selected by chance, every other one being selected as they entered the hospital. Males between 18 and 48 years of age who were unvaccinated for typhus, who had no obvious complicating conditions at the time of admission and who had had the disease not longer than a week were selected for the treatment or to act as the control group.

In all cases the para-aminobenzoic acid was given by mouth. Patients took the powdered form readily if it was suspended in water or partially dissolved in a sufficient volume of five per cent

sodium bicarbonate solution to render the mixture slightly alkaline.

The initial dose varied from four to eight grams. In the majority of cases the initial dose was followed by two grams every two hours unless the concentration in the blood attained excessive values. After experimentation it was decided to continue the treatment until the patient's rectal temperature was 99.5 degrees Fahrenheit or less for 24 hours.

After it was found that nausea and vomiting occurred after taking the acid, sufficient sodium bicarbonate was given to neutralize the para-aminobenzoic acid. Fifteen patients who received the treatment had a definite rash, which was not as extensive, however, as that seen in the majority of patients not receiving the acid treatment.

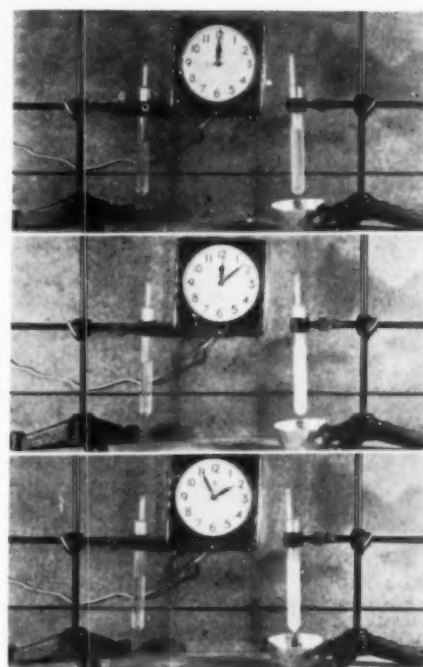
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CHEMISTRY

New Glass Able to Resist Hydrofluoric Acid

► **A NEW GLASS** for laboratory utensils, acid containers, safety goggles and other purposes in which protection against the action of hydrofluoric acid is essential has been developed in the laboratories of the American Optical Company. It is the first known glass to offer major, desirable resistance to the attack of this powerfully corrosive acid, which disintegrates ordinary glass, destroys most metals, and produces dangerous burns on human flesh.

The discovery of the new glass is expected to simplify the handling of this industrially important acid, which is used extensively in scientific laboratories, and in such industrial operations as the pickling of metals, etching of glass, processing of textiles, manufacture of fluor-



RESISTS ACID—The test tube at the left is made of the new glass, while the one at the right is of ordinary glass. At 12:00 o'clock (top picture), hydrofluoric acid was poured into both tubes. Instantaneously the acid attacked the tube made of ordinary glass. In a few minutes (middle picture), the ordinary tube is corroded, while the tube at left is still transparent. In less than two hours (bottom picture), the acid has eaten through the tube of ordinary glass and has spurted through the hole into the platinum dish and onto the floor.

ides and ceramics, and as a catalyst in oil refining and synthetic rubber manufacture.

The new glass contains no sand, the basis of all commercial glasses. Its major ingredient is phosphorus pentoxide, which by itself reacts with water instantly and with almost explosive violence. The profound chemical changes that take place in making the new glass result in a product less soluble in water than ordinary glass. It is transparent and has melting and working properties about the same as ordinary glass, can be cast or drawn into sheets or blown into bottles or other shapes. It can also be ground and polished, tempered and subjected to other processes involved in glass technology without special equipment or technique.

Science News Letter, January 6, 1945

GENERAL SCIENCE

U. S. Scientists Send Journals to Latin America

► SCIENTISTS in the United States are collaborating with their Latin-American colleagues in making available files of journals for new and active institutions where the lack of adequate library facilities has greatly impeded research.

Already the libraries of two such institutions have been implemented by the addition of journals. The Committee on Inter-American Scientific Publication, headed by Dr. Harlow Shapley, director of Harvard Observatory, is now collecting journals for a number of other Latin-American institutions.

Scientists who have unused files of journals which they are willing to contribute are invited to communicate with the Comité Interamericano de Publicación Científica, Harvard College Observatory, Cambridge 38, Mass.

Science News Letter, January 6, 1945

TECHNOLOGY

Shoe Uppers May Soon Be Given Oil Treatment

► SHOE UPPERS may soon be given oil treatment similar to that now increasingly used for shoe soles and wear longer as a result. Laboratory research work is now under way to determine the best processes of treating upper leather, and whether or not the treatment is economically desirable.

Oil treatment of soles increases their wearability by 25% on an average, according to the director of the laboratory of the Tanners' Council of America at the University of Cincinnati, where extensive investigations have been made. The National Bureau of Standards conducted extensive research on the improved wearing qualities of treated sole leathers during 1943 and found their life increased from 14% to 40%, depending upon the preparation used. The higher percentages were for wax-impregnated soles.

All leather soles on Army shoes are now treated with a formula developed at the Cincinnati laboratory of the Tanners' Council, and a similar formula, with slight changes made by the War Production Board, is now used on millions of civilian shoes under a voluntary program fostered by the board. Civilians in the future will need fewer shoes a year.

If uppers have an equally increased life with oil treatment, the annual shoe

bill of America will be still further decreased, and greater quantities of leather will be conserved for other uses. Approximately 250,000,000 pairs of shoes with leather soles were produced in the United States in 1943; a reduction of 25% in this quantity represents a lot of leather as well as millions of dollars in savings.

Science News Letter, January 6, 1945

ZOOLOGY

Pet Deer Gives Birth To Triplet Fawns

See Front Cover

► THE FAWN TRIPLETS shown with their mother on the front cover of this SCIENCE NEWS LETTER were born about the middle of last August. Frank W. Baldwin, who has a deer farm in Pittsburg, N. H., states that Jill, the mother, had previously given birth to two sets of twins.

Twins are more frequently born to deer than to other related hoofed animals, the chances being about even that a doe will give birth to twins instead of to just one fawn. It is, however, quite unusual for a doe to have triplets, and few are on record as having been born in captivity.

Science News Letter, January 6, 1945

PHYSICS

Degree of Heat Controlled In Cordless Electric Iron

► CORDLESS electric flatirons, soon to be in production, draw heating electric current from the house circuit only when the iron is resting on an automatic safety base placed nearby. Two prongs extending from the back of the iron then make electric contact which permits the current to flow through heating elements in the iron. The current ceases to flow when the iron is removed.

The safety base, connected to an electric outlet, contains a thermostat and an adjustable regulator which control the flow of electricity to the iron, and the temperature desired. This prevents overheating, and also eliminates all danger of fire as no current flows after the iron has reached the temperature for which the regulator is set.

This new safety household ironing device was developed in the laboratory of the Eureka Vacuum Cleaner Company, and the company has had authorization from the War Production Board to manufacture a limited number.

Science News Letter, January 6, 1945

IN SCIENCE

INVENTION

No Fog Collects Inside Lenses of New Goggles

► NO FOG collects inside the lenses of new goggles announced recently, regardless of how freely the wearer perspires, because of the sweeping action of fresh air drawn through them over the eyes and into the lungs by the ordinary lung action in normal breathing. They were developed by Polaroid Corporation engineers and have been tested in desert areas and in dust-laden factories.

The plastic goggle lens has a bulbous nosepiece and air intake ports in the frame to the right and left of the eyes. These ports are fitted with filter felts to diffuse the air and to catch any dirt or dust in it. The bulbous nosepiece has an inlet valve through which the air can pass to the nostrils and lungs, and an outlet valve at its extremity for the expulsion of gases from the lungs.

Ordinary breathing draws fresh air through the intake ports and filters where it spreads over the eyes and takes up the moisture from perspiration, then through the inlet valve to the nostrils. Exhaling closes the inlet valve and opens the outlet valve so that the exhaled breath is discharged directly into the open.

Science News Letter, January 6, 1945

CHEMISTRY

Plastic Soil Conditioner Tested in Michigan

► A GOOD moisture-conserving soil conditioner, a kind of artificial humus, was reported by Mrs. I. M. Felber of the Michigan Agricultural Experiment Station. The material is methylcellulose, which is classifiable as a cellulose plastic. Worked into the soil, it absorbs and holds moisture, making it available for plants when the unmodified soil would no longer be able to sustain them.

Other possible uses for methylcellulose include tree wound dressings; protective coating for seeds and fruits against insects, fungi and bacteria; protection for plants and cut flowers in shipment; preventive for root drying during transplanting; and laboratory culture medium for bacteria.

Science News Letter, January 6, 1945

SCIENCE FIELDS

PHYSICS

39-Year-Old Physicist Heads GE Research

► A PHYSICIST who is not yet 40 years of age took over the direction of the General Electric Company's research laboratory at the end of the year. He is Dr. C. G. Suits who has been elected a GE vice president.

He succeeds Dr. W. D. Coolidge, inventor of the Coolidge X-ray tube and GE research director since 1932, who retired as vice president and research director.

Dr. Chauncey Guy Suits was born in 1905, the same year that Dr. Coolidge joined the then embryonic GE research laboratory.

War radio research in the Office of Scientific Research and Development has occupied the major part of Dr. Suits' time during the past few years. Dr. Suits has been assistant to Dr. Coolidge since 1940.

Science News Letter, January 6, 1945

CHEMISTRY

Lighter Weight Blankets From Silicon Compound

► POSTWAR BLANKETS and sleeping bags may weigh but a few ounces, yet afford greater warmth than a mink coat or red flannels, as the result of a new development in the textile industry, an insulating material that weighs as little as three pounds per cubic foot and in point of low heat transfer is about twice as efficient as cork.

Known commercially as Santocel, it is an organic silicon compound perfected by research chemists of General Electric Company, Schenectady, N. Y., and the Monsanto Chemical Company. A derivative of silica, or sand, the compound is one of the most versatile chemical skeletons known to man. It looks like finely ground snow, and pours like water. In a cupful of the material there are literally millions of dead air pockets, which act to slow up the transmission of heat or cold. It is also employed as insulating agent between quilted layers of fabric designed for use in hunters' coats, life jackets and life rafts.

Postwar refrigerators may be thin-walled if they make use of the new prod-

uct, occupying no more kitchen space than present models but giving 40% more cubic content.

Used in camouflage coatings, the silica compound breaks up surface light rays, affording a desirable dull sheen. It is also used in rubber to add strength without carbon black's discoloring effects.

Research is being conducted to determine new uses for the material. Recently they found that it could be poured between the layers of uncut velvet, sealed in with thermoplastic stitching in millions of little pockets, and the cloth used for lightweight dressmaker coats for women.

Science News Letter, January 6, 1945

ENGINEERING

Connector Block Simplifies Wiring for Aircraft

► BUILDERS of modern aircraft, like the giant B-29 Superfortress which has over ten miles of electrical wiring, may benefit from a new connector block system of electrical connecting that eliminates many of the plugs and sockets, yet permits additional electrical systems to be added with ease.

Developed by the Technical Board of the Society of British Aircraft Constructors, the new system employs a series of connector blocks with leads directly to the main power source, a generator or batteries. Simplified plug-in leads extend from the connector blocks. The blocks, made from lightweight plastic, are available in two-, three-, five- and 15-way units, either in single or double tiers. Should it become necessary to increase the number of leads, another connector block of larger capacity is added.

Compact in size, the new connector blocks are not much larger than an ordinary match box. The five-way unit measures 2½ inches wide, 1¼ inches high and 1½ inches deep.

The new system is standard for all new types of British aircraft. In operation, if a part of a plane, such as a wing, has to be detached and replaced or repaired, all the electrician has to do is un-plug the leads from the connector block, and plug them in again when the wing is re-installed. The operation is as simple as plugging an electric toaster into a wall receptacle.

A spray-proof cover and a "honeycomb" wiring pattern check moisture condensation, which accumulates as the aircraft gains altitude and passes from warm to cold atmospheres.

Science News Letter, January 6, 1945

INVENTION

Milkweed Gin Separates The Floss from the Seed

► A MILKWEED gin, that separates milkweed floss from its seed as cotton lint and seed are separated in a cotton gin, is the invention on which patent 2,362,965 has been awarded to Dr. Boris Berkman, Chicago physician who demonstrated that milkweed floss can be a satisfactory replacement for war-scarce kapok in life-saving apparatus.

Essential part of the apparatus is a wide, flat, flexible-walled tube through which the floss is carried by a gentle air blast. During its passage, it is constantly agitated by a series of mechanically driven rollers, which shake the seed loose. At the end of the run, the freed floss is carried upward by the air current, while the heavier seed fall into a hopper, to be carried off for oil extraction and other by-product uses.

Science News Letter, January 6, 1945

ORNITHOLOGY

Christmas Census Checked Number of Birds in Country

► THE FIRST Christmas began with the taking of a census in Judea—read the Gospel according to St. Luke, beginning with the second chapter. And in this country a census marks Christmas still; only it is a census of winter birds instead of people.

On Christmas Day, and a few days before and after, thousands of persons interested in birds ranged woods and brushlands and open places, noting down the names of all birds they saw and checking the numbers. Takers of this avian census range in age from Boy and Girl Scouts to their grandparents, in scientific learning from university ornithologists to enthusiastic amateurs.

The Christmas bird census does not pretend to count every bird in the country. It undertakes merely to make a careful listing of all the birds in numerous good sample habitats, many of which are revisited and rechecked year after year. A good idea of the fluctuations in the bird population of a given area can thus be obtained.

The Christmas bird census, which has been going on annually for some 30 years, is sponsored by the National Audubon Society. Results are collated and published in a special supplement of the Society's official journal.

Science News Letter, January 6, 1945

GENERAL SCIENCE

Science Previews

We can look forward in 1945 to a redirection of scientists and laboratories toward goals of peaceful living. Don't expect big advances.

By WATSON DAVIS

► THE YEAR 1945 may be known to future historians as the year of the introduction of atomic power or the year that the World Research Administration was founded.

Or our grandchildren may rejoice in the discovery of the cause and cure of cancer in 1945. Or the synthesis of a chemical that banished tuberculosis as a major plague.

These hopes for 1945 are more likely to be wishful thinking—like most New Year's resolutions.

We can look forward in 1945 to a redirection of science and technology toward peaceful living and reconversion. Our physicists, chemists, biologists and medical researchers are tapering off their essential and fruitful service of science to the war.

It takes many months for ideas and demonstrations of new scientific weapons to be translated into practical implements for fighting. For that reason the new methods and weapons that may be introduced by our Army and Navy, if they are to appear before the major phases of the war are over, must be well out of the laboratory by now.

Reconversion Takes Longer

Reconversion of our scientific laboratories and our scientists can and must proceed faster and earlier than even the reconversion of our manufacturing plants and factories. In the long run there is more at stake. If we are to make the world a better place in which to live, and if we are to assure the research advances for the future from which the fabric of our future civilization is woven, we must get the scientists and the engineers busy promptly upon non-war researches on wide fronts.

We must see to it that the young men of scientific talent who have been fighting our wars are able to return to college and technical school to prepare to man the research laboratories of future years.

When D-Day of Europe was being prepared, more than 100,000 boys being sent to college by the Army were rushed

into the infantry services as an emergency measure. As soon as the emergency is over with the fall of the German war machine, these boys and others who show similar ability should be assigned back to our technical schools, medical colleges and universities as an urgent national policy. The continuance of their training is not to benefit them or give them any privileges, but to enable them to serve their nation in peace to their best ability.

Wounded men and others who are discharged from the armed services should be given educational opportunities according to their abilities, but the searching out of the youth who have research abilities is a different and nationally more urgent task. It should proceed while the Pacific war continues.

Our universities and technical schools have already come painfully close to disorganization due to the impressing of

their faculties and their students into the war, either as researchers or fighters. During 1945 this will need careful financial and educational attention from the government.

In the meantime, the research laboratories of our great and small industries will expect during 1945 to have a chance to resume the experimental pioneering that will bring forth new and better products when the production of civilian consumption goods can be resumed in full measure.

Penicillin and DDT

Among the war developments in science that are likely to be made available to the public in larger degree during 1945 are penicillin which can be expected to be proved effective in treating even more diseases; and DDT, the chemical that has proved so effective in controlling disease-carrying insects and insects that cause crop and household damage.

Measles will be attacked on a large scale as a public danger by the distribution through health departments of gamma globulin, a fraction of human



DEVASTATION—Brought by war is typified in the U. S. Navy picture of a battered Cherbourg railway station.



RESTORATION—When peace returns, man must rebuild and resume his eternal battle against disease-carrying insects and other destructive agencies.

The picture shows U. S. Public Health Service scientists at work.

blood donated for the war. This substance can be used to immunize against measles and thus control it effectively.

Previous wars have almost always been accompanied by epidemics and plagues of world-wide scale, but this war, thanks to the advances of medicine and the application of health measures, has brought forth so far no such menace. Health authorities hope that this will continue to be the case, and they confidently expect the health of the United States in 1945 to continue at a favorable low level of disease and death.

Mental Health Value

With the example of the mentally wounded of the war before them, the public may realize that one of the great problems of the world is human behavior or mental health. Psychiatrists and psychologists know much more about the ills of the mind and how to prevent them than is being applied. The gradual application of some of this knowledge may receive renewed impetus during 1945.

The organization and administration of medical care in all its aspects continues to be a major American problem, the subject of much emotion and propaganda. Through the extension of the

social security methods, some approach to the solution of this problem may be made under congressional mandate.

Congress may also decide that the efficient and well-implemented, although little publicized, organization of scientific research for war should be continued in some of its aspects into the reconversion period. The fundamental principle of conducting necessary research in the public interest in educational and industrial research laboratories would probably be continued either during a transition period or perhaps upon a continuing basis.

Those who look into the future of science see rocket planes streaking through the stratosphere faster than sound's speed, houses stamped out of airplane factories like so many doughnuts, food that lasts forever and tastes like the nectar and ambrosia of the gods, new chemicals that will banish old age, and other near miracles of science and technology.

In the continuing war year of 1945 these things can hardly be expected to be accomplished. Many of them may never come true, but that will not stop the scientists and engineers who are released from plotting death from trying their utmost to bring such accomplishments to the earth of everyday living.

Science News Letter, January 6, 1945

SCIENCE INFORMATION

for Members of the
Armed Forces OVERSEAS

IN order to serve the armed forces, Science News Letter recently offered its new monthly Overseas Edition to men and women outside the United States.

This special edition is geared to the armed forces—it contains scientific information interesting and useful to them. News important to us here, but not to them there, is cut out in order to pack the Overseas Science News Letter with the science information of greatest interest and use to members of our armed forces Overseas.

It is just sixteen pages (like the Science News Letter you are reading), but it is pocket size, printed on Air Mail weight paper, and the pictures and types are one-third smaller than the regular weekly edition. It is mailed by FIRST CLASS MAIL to service people Overseas each month, for \$1.25 per year.

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O-833

Do You Know?

Canada has 84 sanctuaries for birds, including wild ducks, geese, and other migratory water fowl which visit the United States annually.

Two diesel locomotives are now in use on the government railroad in Alaska between Anchorage and the new deep-water port at Whittier; because of tunnels on the line coal-burning engines are not desirable.

Many species of bamboo from the Far East have been brought to America and are growing successfully in Georgia, Florida, Louisiana and Puerto Rico.

The pilchard, or *California sardine*, leads the United States fisheries, accounting for approximately 25% in weight of all United States and Alaska fish landings.

Crossline pigs, obtained by crossing inbred pure lines, give promise of being highly efficient pork producers with a lower death rate while young and a heavier weight throughout their life.

Stirrup pumps designed for fire-fighting by the Office of Civilian Defense are now being used for insect-fighting.

Rutin, a little known glucose drug obtained from certain types of tobacco, is used in the treatment of a tendency to hemorrhage; a new and improved process for its extraction has been developed.

Four insect pests likely to attack potatoes are potato leaf hoppers, Colorado beetles, fleabeetles, and aphids; copper-compound sprays repel the leaf-hoppers, arsenate of lead or calcium kills the beetles, and nicotine the aphids.

Cantaloups and cucumbers can be planted side by side as they are not closely enough related to cross, but cantaloups will cross with melons and pumpkins although the effect does not show that same year.

The principal forestry wealth of Guatemala consists of construction and cabinet woods such as mahogany, cedar, pine, balsa, quayacan and palo blanco.

PUBLIC HEALTH

Maximum Manpower

Health and physical fitness efforts should start much earlier than proposed year of military training if greatest number are to be fit.

► THE PROPOSED year of military training for youths of 17 or 18 would give the nation many more young men fit to fight on any future M-Day than we had at the time of the Pearl Harbor attack. For getting the maximum manpower in fighting trim, however, health and physical fitness efforts should start much earlier.

British experience early in the war showed that men unfit for fighting, even though they had no serious defects or disease, could be strengthened and hardened in much less than a year's time by suitable feeding and physical exercise.

A year of military training would have the further advantage of getting our young men used to Army life and discipline. This would be easier at 17 or 18 than at 25 or 30 years. Certain physical defects, such as hernias and bad teeth, could be corrected. Syphilis and gonorrhea could be cured. At the end of the year, the young men would undoubtedly be stronger and healthier, and the nation would have more potential fighting power.

A great many young men, however, would still be lost to the Army because of disease or defects that could not be corrected at the age of 17 or 18, though they might have been prevented by proper attention at earlier ages.

Of 4,217,000 men between 18 and 35 rejected up to June of 1944, 273,300 were for heart and blood vessel diseases. A very large percentage of the heart disease among young adults starts with rheumatic fever in early childhood. By the age of 17 or 18 the heart damage has already been done. While rheumatic fever is not yet preventable, there is good evidence that it may soon be through suitable sulfa drug treatment of streptococcus infections.

Of the 212,700 rejections for eye defects, probably very many could have been avoided by better care of the eyes and of eye infections and by greater attention to prevention of accidents in childhood.

The same is probably true of the 162,900 rejections for ear defects, which range from a punctured ear drum to total deafness. Punctured ear drums and a

good deal of hearing loss occurring among young adults results from infections such as colds and various childhood diseases. Better treatment of these ailments, including prompt attention to ear infection if it occurs, would salvage many thousands of young men for military duty, to say nothing of what it would mean for their own health and peacetime efficiency.

Rejections for bad teeth were very low, only 36,100. This was because the armed forces kept lowering their dental standards to procure manpower. It meant that about one-third of the nation's dentists had to be called into the services to do the tremendous job of repairing and restoring decayed or missing teeth in the men accepted for service.

The biggest single medical cause of rejection, as is well known, was for mental disease. The origin of this kind of trouble can often be traced to conditions affecting a person when he was a small child. Family life and early training play a highly important part in making or marring mental health.

What could be accomplished by a year of military training at the age of 17 or 18 is a debatable question. Psychiatrists have said, over and over, that putting a man into the Army is not the way to cure mental sickness, even in its milder forms. For the average youth of 17 or 18, a year of military training might not cause any difficulty and might be good from the mental health standpoint.

There should be very careful psychiatric selection, however, because this age is a time of life when military training might do some damage to a youth with a personality weakness. If a trend toward psychoneurotic illness was already present, it might be made stronger and a breakdown rather than the desired strengthening of health might result.

Science News Letter, January 6, 1945

Only about 60% as many sealskins were harvested last summer on the Pribilof Islands, the center of the seal-fishing industry, as were taken in 1943 when an unusually large number were obtained to make up for the 1942 shortage.

MEDICINE

Toxic Effects Treated

One of the B vitamins has been used to counteract the ill effects of three different drugs. Previous methods had been disappointing.

► PYRIDOXINE, or vitamin B₆, has been used successfully to treat three patients suffering from the toxic effects of each of three drugs, Dr. Max M. Cantor and Dr. John W. Scott, of the University of Alberta, report. (*Science*, Dec. 15)

The drugs were sulfathiazole, aspirin and thiouracil. The latter is a new remedy for the kind of goiter that comes from an overactive thyroid gland.

Agranulocytic angina is the name for the condition which the three patients acquired as a result of these drugs. This disease is characterized by acute illness with fever, necrotic and ulcerative sores in the mouth and pharynx, and an extreme reduction of the number of granulocyte cells in the blood. It occasionally occurs without any apparent cause but more often follows the use of certain drugs such as amidopyrine, some bar-

biturates and dinitrophenol. Since the sulfa drugs have been used to treat bacterial infections, agranulocytic angina has been seen more frequently, the Canadian scientists point out.

Previous methods of treating the condition have often been disappointing.

The temperature in each of their cases fell to normal and symptoms disappeared within 48 hours after daily doses of pyridoxine had been given by hypodermic injection into a vein.

Since this vitamin was effective in overcoming illness due to three different drugs, the Canadian doctors suggest that it acts by stimulating the myelocytic elements of the bone marrow.

Their results suggest that the vitamin may widen the use of a large group of valuable drugs.

Science News Letter, January 6, 1945

out the other side of the house. The saw had broken loose from a nearby saw mill.

In his haste to dress for a game, a young football aspirant of Chicago put his jersey on backwards. Tugging fiercely to get it off, he broke his neck. And a housewife of Indianapolis dislocated a vertebra in her neck while vigorously brushing her teeth. Both recovered.

Science News Letter, January 6, 1945

CHEMISTRY

Continuous-Process Method For Turpentine and Rosin

► A CHEMICAL invention of value in both war and peace is a continuous-process method for the production of turpentine and rosin from the crude gum as it comes from the trees. This process was developed by a chemical engineer of the U. S. Department of Agriculture, Jesse O. Reed; rights in his patent, No. 2,363,692, are assigned royalty-free to the government.

The process flows through a succession of distilling columns, with steam temperatures maintained at the lowest point at which the work can be done. By doing this, the inventor explains, not only as a greater over-all economy achieved, but the quality of the rosin obtained is made considerably higher than that resulting in the old-fashioned batch processes, where higher temperatures have to be used.

Science News Letter, January 6, 1945

SAFETY

Odd Accidents

Freak mishaps right at home turn up in annual summary by National Safety Council of how people can get hurt without going to war.

► A PRIVATE, demonstrating to his wife how a booby trap works, was shot in the leg by the device he had hooked up from a shell, board, nail and piece of wire. This injury to a soldier home on furlough is among those which the National Safety Council lists in its 1944 round-up of odd accidents.

Another soldier, sent home to recuperate from wounds received in the South Pacific, found that life can be just as dangerous at home as in the thick of battle. As he watched a power lawnmower at work in his front yard, the thing picked up an old spoon left on the grass and hurled it with such force and accuracy that it penetrated the calf of his leg and had to be removed by an operation.

A two-year-old of Groton, Conn., had her sleep disturbed by a Navy plane which plowed through her bedroom and

whisked the blanket off her bed without touching her. The plane, zooming through the other wall of the house, crashed into a schoolhouse. The blanket, undamaged, was found in the wreckage.

Returning from a hunting trip, a family man in St. Louis placed his rifle on a high kitchen shelf where the children couldn't reach it. His wife, before leaving home to visit a neighbor, took all the arrows away from her young son, leaving him with only the bow. But the ingenious son substituted a yardstick for an arrow and let it fly from the back porch toward the kitchen. Going through a hole in the screen door, the yardstick struck the trigger of the rifle. The rifle went off and the bullet struck his little sister.

A Floridian was eating breakfast one morning when a buzz saw ripped through the kitchen wall, sliced the breakfast table neatly in half and whirled



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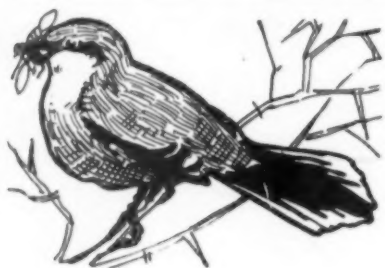
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Winged Wildlife

► **WINGED WILDLIFE**, to almost anyone, probably connotes only birds—game birds first of all, with songbirds coming in almost as an afterthought.

But there is other winged wildlife in the woods and over the waters, not to be neglected in any attempt to get a significant picture of the biotic complex of any given area. Insects form the major part of the food of many species of birds and fish, reptiles and amphibians. They are carriers of pollen necessary for the development of seeds and fruits that serve as food for others. Some of them are enemies of larger wildlife; some befriend us and the other warm-blooded animals by preying on these enemies.

Need for better understanding of this complex and as yet but little understood part of the life of our forests and fields was called to the attention of the American Association of Economic Entomologists by a special committee under the chairmanship of Dr. H. H. Stage of the U. S. Bureau of Entomology and Plant Quarantine. Citing the great success of the U. S. Fish and Wildlife Service in preserving and increasing the larger species of direct interest to sportsmen, conservationists and nature lovers, the committee stressed the importance of first learning more about the insect element in the web of wildlife and then applying that knowledge for the encouragement of "good" insects and the restraint of "bad" ones.

Something has already been learned, the committee pointed out, of the importance of managing insect life in the task of managing fish. Some waterside areas where fish never swim or go to lay their eggs are nevertheless very important to the fish, because the insects that they eat breed there. It has also been discov-

ered that the practice of neatly clearing the brush away from shorelines may be a very bad thing for the fish, because insects first roost on these shrubs and straggling trees, then drop into the water where trout or bass may snap them up. The cycle is short but conclusive: no bushes, no bugs; no bugs, no bass.

Entomologists who are concerned with the encouragement of useful insects are looking at the prospects for wholesale insecticidal campaigns based on DDT with a certain degree of apprehension. DDT is no respecter of insects; it kills "good" and "bad" ones without discrimination. So if it is found necessary to use DDT to rid a forest area of, say, a gipsy-moth infestation, we must be prepared to face the prospect of its killing also the dozens of other insect species that provide food for the songbirds and for the fish in the trout streams.

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CHEMISTRY

Synergy in Chemistry Increases Effectiveness

► "TWO PLUS two makes five," or "The whole is greater than the sum of its parts," expresses the basic idea of the term synergy as used in chemistry, stated Dr. Pat Macaluso of Foster D. Snell, Inc., at the meeting of the American Chemical Society in New York. As an example he referred to pyrethrum, a common active agent poisonous to flies, whose effectiveness is tripled when mixed in the spray with a small amount of sesame oil, which in itself is harmless to household flies.

Dr. Macaluso presented a generalization of the nature of synergy and the factors underlying it, which, he said, have now been made for the first time in the field of industrial chemistry, but do not represent any new discovery of principle.

Synergy in chemistry is the cooperative action of two distinct substances "such that the total effect is greater than the

sum of the two effects taken separately," he explained. "It is a commonplace of chemistry," he continued, "that a greenish yellow poison gas like chlorine and a bright silvery inflammable metal like sodium will react to give common table salt or sodium chloride, which is neither sodium metal nor chlorine gas, nor their sum or average."

Dr. Macaluso examined a large number of examples of synergy from diverse fields of industrial chemistry to determine if the many different systems displaying synergy possess any common factors in their mechanisms which can guide the industrial chemist in his work.

"The factors underlying all truly synergic phenomena," he stated, "were found to be self-association, packing effects, dissymmetry and inter-action of components. Thus mixture of an inert diluent with a solvent whose molecules are combined or associated with other molecules of the same substance may cause these associated molecules to separate, thereby altering the solvent properties."

These factors are important in making plastics.

"Synergy which is so common in pure or theoretical chemistry as to hardly merit notice," he continued, "acquires tremendous importance in applied chemistry. It means tripling the effectiveness of an insecticide or doubling the yield of a reaction. It represents a saving of time and money, conservation of materials, longer life and better use for the creations of the chemist."

Armed with a knowledge of the nature of synergy, chemists can speed the solution of their problems and better realize the hidden possibilities of the materials with which they work.

Science News Letter, January 6, 1945

Trout get about two-thirds of their food from the waters in which they live and the remainder from a few inches of air above the water where insects may be caught on the wing.

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SCIENCE NEWS

• Books of the Week •

► **BOTANISTS**, and students of the life sciences generally, will find Stanley Cain's **FOUNDATIONS OF PLANT GEOGRAPHY** a challenging book. Prof. Cain endeavors to go beyond the concepts underlying present-day plant geography and to introduce more dynamic points of view. In doing so, he draws upon all available resources of ecology, paleobotany, and especially genetics. What he says is not intended for the final word, but rather as the opening statement of a new and far-reaching discussion. (*Harper*, \$5).

Science News Letter, January 6, 1945

► **WOLVES** have been hounded practically to extinction over almost the whole of United States territory; only in Alaska is there sufficient wild country remaining for them to live as they always have lived. In **THE WOLVES OF MOUNT MCKINLEY**, an able biologist of the Fish and Wildlife Service, Adolph Murie, gives us a complete and close study of a major sample of this fauna, especially in its relation as predators on the Dall sheep. The text is livened with vivid little sketches and many good photographic illustrations. (*Supt. of Public Documents*, 40c).

Science News Letter, January 6, 1945

► **LAST SUMMER**, word came of the tragic death in an automobile accident of Frère Marie Victorin, leading Canadian botanist. Fortunately for science, before his passing he was able to see through the press the second volume of **ITINERAIRES BOTANIQUES DANS L'ILE DE CUBA**, written in collaboration with Frère Léon, of Havana. All who are interested in tropical vegetation, and all who like to read clear, lucid French prose, will know how to appreciate this book (*Institut botanique de l'Université de Montreal*, \$2.50).

Science News Letter, January 6, 1945

► **SOUTHERN HORTICULTURE**, by H. P. Stuckey, is a gratifying addition to a growing literature of scientific textbooks intended specifically for use in Southern Educational institutions, and adapted for Southern materials and conditions. (*Turner E. Smith and Co.*, Atlanta, \$2.56).

Science News Letter, January 6, 1945

► **SNOWSHOE COUNTRY** is another vividly-written, beautifully-illustrated book of the out-of-doors by the well-known wife-and-husband team, Florence Page Jaques and Francis Lee Jaques. In a winter when travel is largely impossible, it brings a breath of the still, chiaroscuro beauty of the great North Woods. (*Univ. of Minn. Press*, \$3).

Science News Letter, January 6, 1945

► **PROPHET** of the new concept of regional development, Morris Llewellyn Cooke, in **BRAZIL ON THE MARCH** (*Whitelsey*, \$3), gives us a rapid but provocative view of what is in prospect for our great neighbor nation. If even a part of the plans are realized, the Colossus of the North will before long find itself in company with a Giant of the South.

Science News Letter, January 6, 1945

► **PLANTS** that grow in the water are apt to be neglected—most humans are too dainty-

footed to go into wet and mucky places; yet some of the most fascinating botanizing is to be found in these watery habitats. As encouragement to get better acquainted with this flora, W. C. Muenscher offers **AQUATIC PLANTS OF THE UNITED STATES** (*Comstock*, \$5). Good, concise descriptions are supplemented with plenty of clean-cut line illustrations and distribution maps.

Science News Letter, January 6, 1945

► **MOST UNDERGRADUATES** shy off from the several excellent dictionaries of scientific words and roots, partly because of their relatively high cost, partly because of their formidable bulk. P. H. Yancey's **INTRODUCTION TO BIOLOGICAL LATIN AND GREEK**, is a thin pamphlet in size and sells for only 10 cents; it therefore gets away from these difficulties, yet is able to impart the essentials of an understanding in biological terminology. It constitutes the first number of the *Bios Classroom Series*. (*F. G. Brooks*, Mt. Vernon, Iowa.)

Science News Letter, January 6, 1945

• Just Off the Press •

AMERICAN AVIATION DIRECTORY, AVIATION OFFICIALS AND COMPANIES, UNITED STATES, CANADA & LATIN AMERICA, Fall-Winter, 1944-45—Wayne W. Parrish, ed.—*Telegraph Press*, 680 p., paper, \$5. (vol. 5, no. 2).

AUDELS REFRIGERATION AND AIR CONDITIONING GUIDE FOR ENGINEERS, SERVICEMEN, SHOP MEN & USERS—Edwin P. Anderson—*Audel*, 1242 p., \$4.

HIGH-FREQUENCY INDUCTION HEATING—Frank W. Curtis—*McGraw*, 235 p., illus., \$2.75.

MEDICAL USES OF SOAP, A SYMPOSIUM—Morris Fishbein, ed.—*Lippincott*, 182 p., illus., \$3.

OUR FLYING NAVY—*Macmillan*, 97 p., illus., \$3.75. (Text prepared with assistance of the Office of the Deputy Chief of Naval Operations, Air; Introduction by James Forrestal, Sec'y of the Navy; Preface by Arthur W. Radford, Rear Admiral, U.S.N.; Foreword by Thomas Craven) 80 full-color reproductions.

PERSONAL MENTAL HYGIENE—Thomas Verner Moore—*Grune*, 331 p., \$4.

WHAT ARE COSMIC RAYS?—Pierre Auger—*Univ. of Chicago Press*, 128 p., illus., \$2. (Tr. by Maurice M. Shapiro).

THE WOMAN ASKS THE DOCTOR—Emil Novak—*Williams & Wilkins*, 130 p., illus., \$1.50, 2nd ed.

CHEMISTRY

Green and Yellow Pigments Prepared from Plant Cells

► **GREEN** and yellow pigments from plants, of possible importance in medicine, can be prepared from the plant tissues and cells in which they are embedded by a new process which permits them to be kept indefinitely without deterioration, Dr. Sophia Berkman, Chi-

cago chemist, told a meeting of the American Chemical Society.

The process worked out by her and Dr. Boris Berkman, Chicago physician, eliminates the use of organic chemical solvents, hitherto considered indispensable for this kind of extraction, and depends on physico-chemical means altogether. Full details of the method employed cannot be disclosed at the moment, Dr. Berkman explained, because of a pending application for a patent, in which government-use rights are assigned royalty-free to the government.

Among the extracted pigments of which Dr. Berkman exhibited specimens to her audience were carotin and chlorophyll. Carotin is the yellow-orange material found in carrots, from which it gets its name. Abundant also in practically all green and yellow vegetables, carotin is the stuff from which vitamin A is made. Its importance in medicine is well established.

Chlorophyll is the green pigment that gives most leaves their color, and carries on the work of converting raw materials taken from air and water into sugar and starch with the aid of sunlight energy. Its possible value in medicine is at present a subject of intensive research.

Carotin, chlorophyll and other physiological pigments of their group are ordinarily impossible to keep very long, if they are exposed to the air, as they are oxidizable and not photostable. As extracted by Dr. Berkman's process, they will keep indefinitely without spoiling or losing their original physiological activity.

Dr. Boris Berkman is the man who "discovered" milkweed floss as a replacement for the world's lost supplies of kapok as a filler for aviators' vests and other life-saving equipment (*See p. 9*). He is now operating a government-built plant, where all the milkweed pods collected in a nation-wide drive will be processed. Quota for 1944 was set at 1,500,000 pounds.

Newest milkweed product to show promise is oil from the seed. Tests have shown this to be a good semi-drying oil, similar to soybean oil but more useful in paint because it has less tendency to turn yellowish. Preparations were made to process the great quantities of milkweed seed turned out by the floss-separating machines, and thereby make a valuable addition to available stocks of vegetable oils.

Science News Letter, January 6, 1945

There is no one "best" potato for dehydrating and no best growing area.

• New Machines and Gadgets •

❁ **REFRIGERANT** bottle to keep liquids cool has an inwardly projecting ice receptacle blown in one side. When the receptacle has been filled with ice a stopper is inserted in its neck to prevent leakage. Bottle and receptacle are all in one piece.

Science News Letter, January 6, 1945

❁ **FOOD DEHYDRATOR**, recently patented, consists of two separated chambers: a small steam compartment and a drying chamber. The prepared food, in perforated containers attached to a belt, passes through the steam chamber for blanching, then through a trapdoor into the drying oven.

Science News Letter, January 6, 1945

❁ **DEFEATHERING** compound to remove pinfeathers from plucked chickens is available in an improved form made of a mixture of rosin and petroleum wax. One dipping in the melted mixture gives a sufficient application to remove, when it has hardened, all the pinfeathers without breaking the skin of the bird.

Science News Letter, January 6, 1945

❁ **WHEELS**, quickly attachable to a rocking or straight chair without disturbing the occupant, make it possible to move the person easily. Two rubber-tired wheels on an adjustable axle, with drops for the rockers and cups for the rear legs of the straight chair, are placed in position by tilting the chair slightly forward.

Science News Letter, January 6, 1945



❁ **COLLAPSIBLE** container for drinking water, approved for American soldiers in the tropics, keeps contents sterile and cool. The semi-porous material of which it is made permits slow leakage through its walls as it hangs in the wind, illustrated above, and the evaporation lowers the temperature of the water.

Science News Letter, January 6, 1945

❁ **MANICURING SCISSORS**, so constructed that when the blades are closed together their ends form a cleaner for fingernails, have a file surface on the inside of one of the cutting blades. The other blade forms a cover for the file when the scissors are closed.

Science News Letter, January 6, 1945

❁ **A BABY WALKER**, convertible into a high chair by use of an attachable stand, is strong, economical and safe. The stand, preferably made of tubing, has a rectangular framing to serve as a floor support and horizontal brackets to engage the under side of the frame of the walking seat.

Science News Letter, January 6, 1945

❁ **HEATING APPARATUS**, to use some of the heat that ordinarily passes up a straight vertical flue, has an inside metal exit tube for the gases generated in the heater. This is surrounded by a larger tube down which air is forced into the room by an electric blower.

Science News Letter, January 6, 1945

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